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**ARE PREFERENCES FOR RED WINE IN SPECIAL OCCASION
HETEROGENEOUS?: FORCED VERSUS NON FORCED APPROACH**

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Outline

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7. CONCLUSIONS

2. OBJECTIVES

- ❑ **The objective of this research is twofold:**
 - **To use the Dual Response choice design as an alternative to the traditional CE design usually used to compare both approaches.**
 - **To assess consumer preferences and willingness to pay of red wine consumed in a special occasion in Catalonia obtained from forced and non-forced choice.**

3. CASE STUDY

- ☐ The wine sector in Catalonia, as in overall Spain, represents an important fraction of its agriculture and food industry.
- ☐ In Catalonia there are 12 Designations of Origin (DO), including the DO Cava.
- ☐ They represent more than 90% of the grape growing surface in Catalonia → wine production is specialised in quality wine (DO)

3. CASE STUDY

- ☐ Wine household consumption in Catalonia has diminished from 21.1 litres per capita in 1999 to 13.2 in 2009.
- ☐ Nevertheless, for the same period, quality wine consumption has risen 14.2%.



- ☐ Consumers are experiencing a change of habits, diminishing wine consumption frequencies, but demanding higher quality wines

3. CASE STUDY

- ☐ **The market share of Catalan DO wines in retailer channels and in the HORECA sector in Catalonia is low, concentrating all together the 27.1% in the rolling year ended in September 2007.**
- ☐ **Under this environment, it is of our interest to determine consumers' wine preferences in Catalonia.**

4. METHODOLOGY:

4.1. The Experimental Design

- The traditional and common approach is to analyze forced versus non-forced choices is to realize two studies simultaneously

Sample 1

Choice set # 1	Alt. "A"	Alt. "B"	Alt. "C"
Attribute 1 (A ₁)	Level 1 (L _{1.1})	Level 2 (L _{1.2})	No-Choice
⋮	⋮	⋮	
Attribute n (A _n)	Level 3 (L _{4.3})	Level 1 (L _{4.1})	

1. Considering these available products "A" and "B", which product would you choose?
 "A" ☐ "B" ☐ Neither "C" ☐

Sample 2

Choice set # 1	Alt. "A"	Alt. "B"
Attribute 1 (A ₁)	Level 1 (L _{1.1})	Level 2 (L _{1.2})
⋮	⋮	⋮
Attribute n (A _n)	Level 3 (L _{4.3})	Level 1 (L _{4.1})

1. Considering that "A" and "B" are the only available products, which product would you choose? "A" ☐ "B" ☐

4. METHODOLOGY:

4.1. The Experimental Design

- The alternative approach is the Dual Response Choice Experiment design that we propose in our work.



Choice set # 1	Alt. "A"	Alt. "B"
Attribute 1 (A ₁)	Level 1 (L _{1.1})	Level 2 (L _{1.2})
⋮	⋮	⋮
Attribute n (A _n)	Level 3 (L _{4.3})	Level 1 (L _{4.1})
<p>1. Considering that "A" and "B" are the <u>only</u> available products, which product would you choose? "A" <input type="checkbox"/> "B" <input type="checkbox"/></p> <p>2. Would you purchase your chosen product? Yes <input type="checkbox"/> No <input type="checkbox"/></p>		

4. METHODOLOGY:

4.2. The Econometric modeling

- ☐ Independent of the decision to include or exclude an “opt-out option”, the usually applied model fall within the standard Multinomial Logit. The main assumption that underlie the formulation of this model is the IIA (Independence of Irrelevant Alternatives) constraint.
- ☐ Several models are defined to overcome this limitations → The HEV model relaxes the restrictive IIA property of the MNL model by allowing different scale parameters across alternatives

4. METHODOLOGY:

4.2. The Econometric modeling

- Probability that an individual will choose alternative i from the set C

$$P_i = \Pr(U_i > U_j) = \Pr(\varepsilon_j \leq V_i - V_j + \varepsilon_i) = \int_{\varepsilon_i = -\infty}^{\varepsilon_i = +\infty} \prod_{j \in C, j \neq i} \Lambda \left[\frac{V_i - V_j + \varepsilon_i}{\theta_j} \right] \frac{1}{\theta_i} \lambda \left(\frac{\varepsilon_i}{\theta_i} \right) d\varepsilon_i$$

- The above probability expression collapses to the MNL

$$P_{in} = \frac{e^{\mu V_{in}}}{\sum_{i=1}^{i=I} e^{\mu V_{in}}}$$

Are different in the HEV


- The Utility function:

$$V_{in} = ASC_{no\ choice} + \sum_k \beta_k X_{ki}$$

4. METHODOLOGY:

4.2. The Econometric modeling

- The Utility function to analyze consumers' heterogeneity:

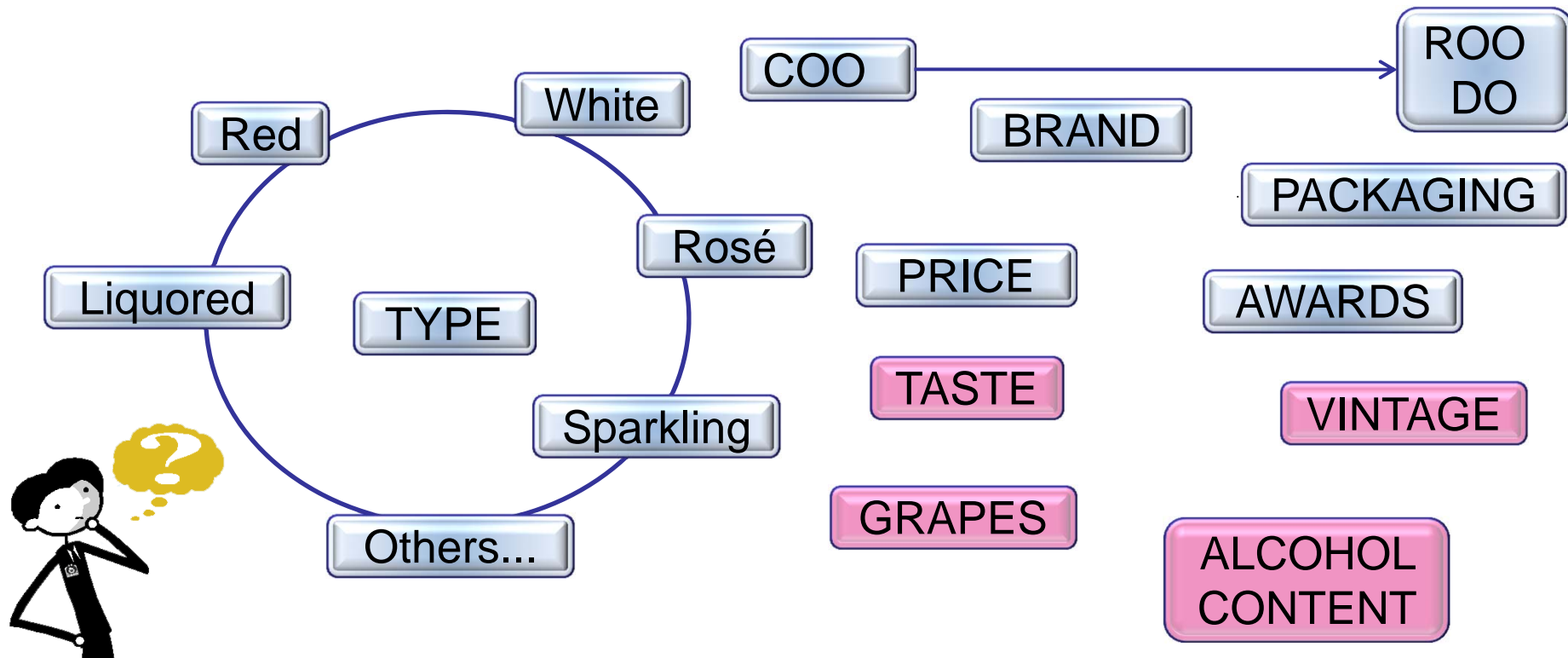
$$V_{in} = ASC_0 + \sum_k \beta_k X_{ki} + \sum_k \sum_p \alpha_{kp} (X_{ki} \times S_{pn})$$


The relationship between the valuations of attributes and respondents particular characteristics (social, demographic and behavioral variables) are included.

5. EMPIRICAL APPLICATION:

5.1. Attributes and levels

- ❑ Wine is a difficult and confusing product for consumers to choose (Lockshin *et al.*, 2006) → immense number of cues



5. EMPIRICAL APPLICATION:

5.1. Attributes and levels

PRICE

When consumers do not have information about the product, it generally performs as a proxy to infer the quality of the product when:

1. The product cannot be evaluated
2. The risk of making a wrong choice is high



It will depend on the consumption occasion



Christmas

5. EMPIRICAL APPLICATION:

5.1. Attributes and levels

COUNTRY OF ORIGIN

- ☐ Plays a key role in the consumers' decision making process

- ☐ In Spain, DO have been claimed as main determinant of wine prices and significant for consumers choices.
- ☐ Nevertheless, studies in Catalonia had not been yet performed

5. EMPIRICAL APPLICATION:

5.1. Attributes and levels

BRAND

- ☐ For some authors is the key unit of decision

- ☐ In our super communicated societies consumers' minds reject to store some information → the amount of information that consumers use to make a decision is small

Or **GENERIC TYPES**

**ROO
DO**

GRAPE VARIETY

- ☐ In Spain mixed results have been found

In our experiment we added two French varieties, and a typical traditional Spanish variety.

We aim to determine if the preference is for French varieties in general.

5. EMPIRICAL APPLICATION:

5.1. Attributes and levels

KWOLEDGE OF THE WINE

- 1. Previous knowledge of the wine**
- 2. Recommended wine and,**
- 3. Prestigious wine.**

Prior tasting experience and recommendations have been determined as consumers' main selection cues when buying wine in retail stores.

By the third level we try to ascertain the effect of a known brand name in front of the other two alternatives.

5. EMPIRICAL APPLICATION:


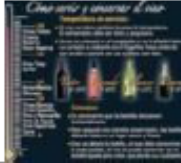


5.2. Experimental design

Attributes	symbols	Levels
<i>Origin</i>	A_1	Catalonia (regional), Spain (national), Imported (international)
<i>Knowledge</i>	A_2	Own Experience, Recommendation, Prestige
<i>Variety</i>	A_3	Cabernet Sauvignon, Grenache, Merlot
<i>Price</i>	A_4	€6 , €10, €14

- ❑ A full orthogonal factorial design → 81 hypothetical products can be generated from $3^4 \times 3^4$ (6,561) possible combinations.
- ❑ Orthogonal fractional factorial design → 9 choice sets

5. EMPIRICAL APPLICATION:

5.2. Experimental design

ELECTION # 1	Alternative "A"	Alternative "B"
Origin 	Foreign	Catalonia
Knowledge 	Prestigious	Personal experience
Variety 	Grenache	Merlot
Price 	€6	€14
<p>1. Considering that "A" and "B" are the only available products, which product would you choose? "A" <input type="checkbox"/> "B" <input type="checkbox"/></p> <p>2. Would you purchase your chosen product? Yes <input type="checkbox"/> No <input type="checkbox"/></p>		

5. EMPIRICAL APPLICATION:

5.3. Heterogeneity analysis

☐ Included variables to analyze consumers' heterogeneity:

Social and economic variables:

- Gender
- Age
- Household social class
- Place of birth

Variables related to attitude towards Catalan wines:

- Catalan wines have good flavor, texture and palate
- Catalan wines possess well known brands and have public prestige and,
- Catalan wines are reasonably priced

Behavioral variables related to wine involvement:

- Wine purchase frequency
- Reading the information about wine published on the press

5. EMPIRICAL APPLICATION:

5.3. Heterogeneity analysis

□ As an example, the utility function for the gender variable:

$$\begin{aligned}
 V_{jn} = & ASC_{OPT-OUT} + \beta_{ORIG_1} \cdot ORIG_{1j} + \beta_{ORIG_2} \cdot ORIG_{2j} \\
 & + \beta_{KNOW_1} \cdot KNOW_{1j} + \beta_{KNOW_2} \cdot KNOW_{2j} \\
 & + \beta_{VAR_1} \cdot VAR_{1j} + \beta_{VAR_2} \cdot VAR_{2j} \\
 & + \beta_{Price} \cdot PRICE_j \\
 & + \beta_{ORIG_1 \times GEN} \cdot ORIG_1 \times GEN + \beta_{ORIG_2 \times GEN} \cdot ORIG_2 \times GEN \\
 & + \beta_{KNOW_1 \times GEN} \cdot KNOW_1 \times GEN + \beta_{KNOW_2 \times GEN} \cdot KNOW_2 \times GEN \\
 & + \beta_{VAR_1 \times GEN} \cdot VAR_1 \times GEN + \beta_{VAR_2 \times GEN} \cdot VAR_2 \times GEN \\
 & + \beta_{PRICE_1 \times GEN} \cdot PRICE \times GEN
 \end{aligned}$$

5. EMPIRICAL APPLICATION

5.4. Sampling

- Data used in this analysis was obtained from a face-to-face questionnaire with 400 consumers that were qualified by having purchased a bottle of wine in the last 3 months.

Population	Consumers over 20 years who purchase regularly food and are residents in the metropolitan area of Barcelona.
Sample Design	Stratified sample by age and postal districts using proportional affixation to the number of persons by stratum.
Field	Metropolitan area of Barcelona
Sample Size	400
Confidence interval	± 4.9
Confidence level	95.5% (k=2)
Control measure	Pilot survey (25 questionnaires)

Forced Choice				Non-forced Choice			
Variables	Estimates	Std. error	p-value	Variables	Estimates	Std. error	p-value
Spain	0.1154	0.0599	0.0543	Spain	0.0867	0.0560	0.1218
Foreign	-0.6952	0.0833	0.0000	Foreign	-0.6698	0.1313	0.0000
Recommended	0.0523	0.0627	0.4045	Recommended	0.0563	0.0616	0.3605
Prestige	-0.1403	0.0621	0.0239	Prestige	-0.1418	0.0559	0.0112
Grenache	-0.1609	0.0618	0.0092	Grenache	-0.1782	0.0601	0.0030

- All obtained models are significant and show a good fit with highly significant likelihood ratios.

Foreign × GEN	0.2988	0.0838	0.0004	Foreign × GEN	0.1990	0.0820	0.0152
Recommended × GEN	-0.1334	0.0815	0.0915	Recommended × GEN	-0.0858	0.0808	0.2882
Prestige × GEN	0.0598	0.0795	0.4524	Prestige × GEN	0.0303	0.0668	0.6503

- Consumers' red wine preferences for a special occasion in Catalonia are highly heterogeneous. Nevertheless, a general TREND might be elicited from all estimated models.
 - CATALAN origin and the CABERNET SAUVIGNON variety are the most preferred attribute levels.
 - PREVIOUSLY EXPERIENCED wines are preferred over recommended or prestigious wines in most cases.

Attribute: *Origin*

6. RESULTS

- ☐ The willingness to pay for the overall preferred ORIGIN (Catalonia) is higher when the opt-out option is included.
- ☐ The exceptions are the OLDEST SEGMENT of consumers (from 60 to 70 years old) and FOREIGN consumers.

- ☐ For a SPANISH origin, IPs are lower when the opt-out option is taken into consideration, although they REMAINED POSITIVE in all cases.
- ☐ The exceptions are the YOUNGEST SEGMENT of consumers (from 20 to 34 years old), the Spanish consumers that were BORN OUT OF CATALONIA and the UPPER SOCIAL CLASSES.

- ☐ A FOREIGN wine origin DIMINISHES the willingness to pay when the opt-out option was included, thus heightening its negative utility.

Attribute: *Grape variety*

6. RESULTS

6.3. Heterogeneity of consumers' preferences. The Implicit Price-IP

- ☐ The willingness to pay for the preferred GRAPE VARIETY (Cabernet Sauvignon) is higher when the opt-out option is included.
- ☐ The exceptions are HIGH FREQUENCY wine buyers and those AGREEING with the aspects related to CATALAN WINES (good taste, known and prestigious brands and reasonable prices).

Place of birth	2.12	1.91	0.43	2.51	3.07	1.11	-1.27	-1.06	-0.98	-1.44	-0.96	-1.13	-0.85	-0.85	0.55	-1.07	-2.11	0.01
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- ☐ For GRENACHE, there is not such a defined trend in the willingness to pay when comparing forced and non-forced choices.

good taste and pleasant	2.98	1.95	2.33	2.04	-3.24	-2.28	-1.26	-1.74	0.26	0.33	-1.06	-0.29
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- ☐ For MERLOT, the willingness to pay generally DIMINISHES when the opt-out option was included, except for those agreeing with CATALAN WINES having known and PRESTIGIOUS BRANDS.

Attribute: *Wine Knowledge*

6. RESULTS

- ☐ For the generally preferred level (a PREVIOUSLY TASTED WINE) the willingness to pay tends to be higher when the opt-out option is included.
- ☐ The exceptions are MEN, the MIDDLE SOCIAL CLASS and those DISAGREEING with the aspects related to CATALAN WINES (good taste, known and prestigious brands, and reasonable prices).

- ☐ For RECOMMENDED wines, the willingness to pay generally decreases, although a great variability is also found.

- ☐ PRESTIGIOUS wines also DECREASE the willingness to pay when the opt-out option is included
- ☐ The exceptions are the YOUNGEST segment of consumers (from 20 to 34 years old), consumers that seek wine INFORMATION on the press and those AGREEING with Catalan wines having GOOD TASTE and REASONABLE PRICES.

7. CONCLUSIONS

7.1. Methodological results

- ☐ The DRCE design has showed its capacity to analyze in one experiment forced and non forced choice.
- ☐ Non-forced choices heighten preferred levels by increasing their welfare estimates (and vice versa).
- ☐ This tendency is more clearly shown in the most valued attribute (origin).
- ☐ The HEV model is shown to be a good alternative to the standard MNL by relaxing the IIA restriction.
- ☐ More empirical studies need to be done comparing the DRCE design with the traditional CE design.

7. CONCLUSIONS

7.2. Empirical results

- ☐ **Consumers have a high preference for the local (CATALAN) origin of the wine.**
- ☐ **The second highest preference refers to the “Cabernet Sauvignon” Variety.**
- ☐ **Wines that have been previously tasted by the consumer seem to be preferred over recommended or prestigious wines.**

**¡MUCHAS
GRACIAS POR
SU ATENCIÓN!**



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